



Falls Creek Hydroelectric Project, L.P.

Re-Certification Application to the Low Impact Hydropower Institute –
Stage II Review Submission, January 22, 2018, Revised April 23, 2018,
Further Revisions May 17, 2018

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INTRODUCTION

The Falls Creek Hydroelectric Project was conceived by Gary Marcus, General Partner, in the early 1980's. Mr. Marcus wanted to build a renewable energy power plant that was environmentally friendly and would take advantage of the latest technologies in power generation.

The Falls Creek Hydroelectric Project is a small electric power generating facility located near the South Santiam River, 25 miles east of Sweet Home, Oregon. The Project uses an old technology in a new way. For centuries, people have used falling water to produce power. The Falls Creek Project was built using the latest construction techniques, which created a power generating facility with a life expectancy of 50 to 100 years, with little or no impact on the environment.

The Falls Creek Project differs significantly from the major hydroelectric facilities we rely on for electricity. Most of these facilities, like the Bonneville Dam system and Foster Reservoir, generate power from large quantities of water falling a relatively short distance – 100 to 400 feet. These are “Low Head, High Volume” plants.

The Falls Creek Project generates power from a small quantity of water falling 2381 feet. This is a “High Head, Low Volume” plant, and has one of the highest “Head-Pressures” in the Northwest.

The Falls Creek Project makes use of a flowing stream rather than a dam as its water source. At Falls Creek, a pipe (Penstock) diverts excess water from a 5-foot deep pool. Most of this excess water comes from rainfall in the fall and winter and snow runoff in the spring. The amount of stream flow during these periods is frequently greater than 50 cubic feet per second (cfs), and occasionally exceeds 200 cfs. The Falls Creek Project draws about 26 cfs of this flow.

Between August and October, stream flow drops to less than one cfs. Because of the lack of excess water, the plant uses this time-period for routine and preventative maintenance.

From the point where the water is diverted, Falls Creek continues to run 2.3 miles further to the South Santiam River. This section of the creek is very steep, containing no anadromous fish (salmon or steelhead). Along this stretch, only a few trout live in pools formed by falls. During operation of the Project, sufficient water remains in Falls Creek beyond the diversion to maintain these pools.

The 30-inch penstock decreases to 20-inches at the turbine. It carries water from the diversion through 7,380 linear feet of pipe, dropping 2,381 feet down the mountainside to the powerhouse on the edge of the South Santiam River. The entire length of pipe is buried and covered with natural vegetation thus concealing it from sight.

When the water reaches the powerhouse, it creates a pressure of approximately 1050 psi. The Turbine Generator rotates at 1200 RPM and generates an installed capacity of 4.96 Megawatts at full load. The Generator output is controlled by the amount of water entering the diversion at the top. The greater the quantity of water that enters the intake structure, the higher the generator output.

The power plant operates using a GE Fanuc 90-30 PLC control system with a head-end interface computer system called Lookout. The plant can be monitored, and re-started if necessary, via remote control.

Power is generated at 4160 Volts, then transformed to 20,800 Volts for transmission via PacifiCorp's local distribution lines. Power is sold to PacifiCorp under a 35-year power purchase agreement.

Projects like the Falls Creek Hydroelectric Project are environmentally friendly and are highly efficient. Falls Creek is highly automated and operates most of the winter with one-day-a-week maintenance visits by the power plant manager. During the summer months, the entire plant is inspected and overhauled, so the plant begins fall season in optimal operating condition. As climate change and environmental concerns are increasingly public priorities, projects like Falls Creek are long-term examples of projects that serve not just our energy needs, but our global environmental objectives.

In 1986, the Falls Creek Project won the Oregon Governor's Energy Award due to its low environmental impact relative to its energy production. The National Resources Defense Council cited the Falls Creek Project as a model facility in its Spring 1985 magazine, "The Amicus Journal." Vendors familiar with power plants regularly comment on the aesthetics and quality of the facility. The turbine manufacturer's maintenance representative, Jim Mattinson from Gilkes of England, services hundreds of plants around the world and describes the Falls Creek Project as the best maintained project he has seen. The facility and its personnel have an excellent relationship with the regulatory agencies and the local community.

For over 25 years, staff from Falls Creek have sponsored an annual field trip for area school children, typically 3rd and 4th graders. It's a full day of activities and enjoyable for the staff, children, teachers, and parents in attendance. We enjoy watching the children play and learn, ask questions, and explore. We know from their thank you notes that we have reached them and that at least they have been exposed to how clean energy can be a part of their future.

Falls Creek originates in a meadow and flows downstream to the Falls Creek Project's diversion structure at river mile 2.35. The diversion is 5' in height and creates a reservoir 105 feet wide by 207 feet in length and up to 5 feet deep. The reservoir overflows through two sets of screens. The primary screens consist of three self-cleaning 8' long panels with wedge wire O'-Gee screens. One CFS of water passes down a channel at the base of the screens to discharge into the original Falls Creek stream channel and satisfies the required 1-CFS minimum bypass flow. This bypass flow also flushes "trash" material from the screens back into the stream. The water that enters the screen chamber discharges into a 30-inch penstock that is 7,380 feet in length, almost all of it buried. The penstock narrows to 20-inches as it enters the powerhouse. The powerhouse contains a Gilkes 34-inch twin-jet horizontal Pelton wheel and generator with maximum capacity of 4.96 megawatts. Tailwater from the Project discharges into a steel culvert with a metal grate on the downstream end to prevent fish access. The water then travels through a small chute of exposed bedrock and discharges into the South Santiam River near river mile 57.5. The following maps illustrate the Project's intake and discharge features, the elevation drop of the penstock, and steep streambed gradient of Falls Creek.

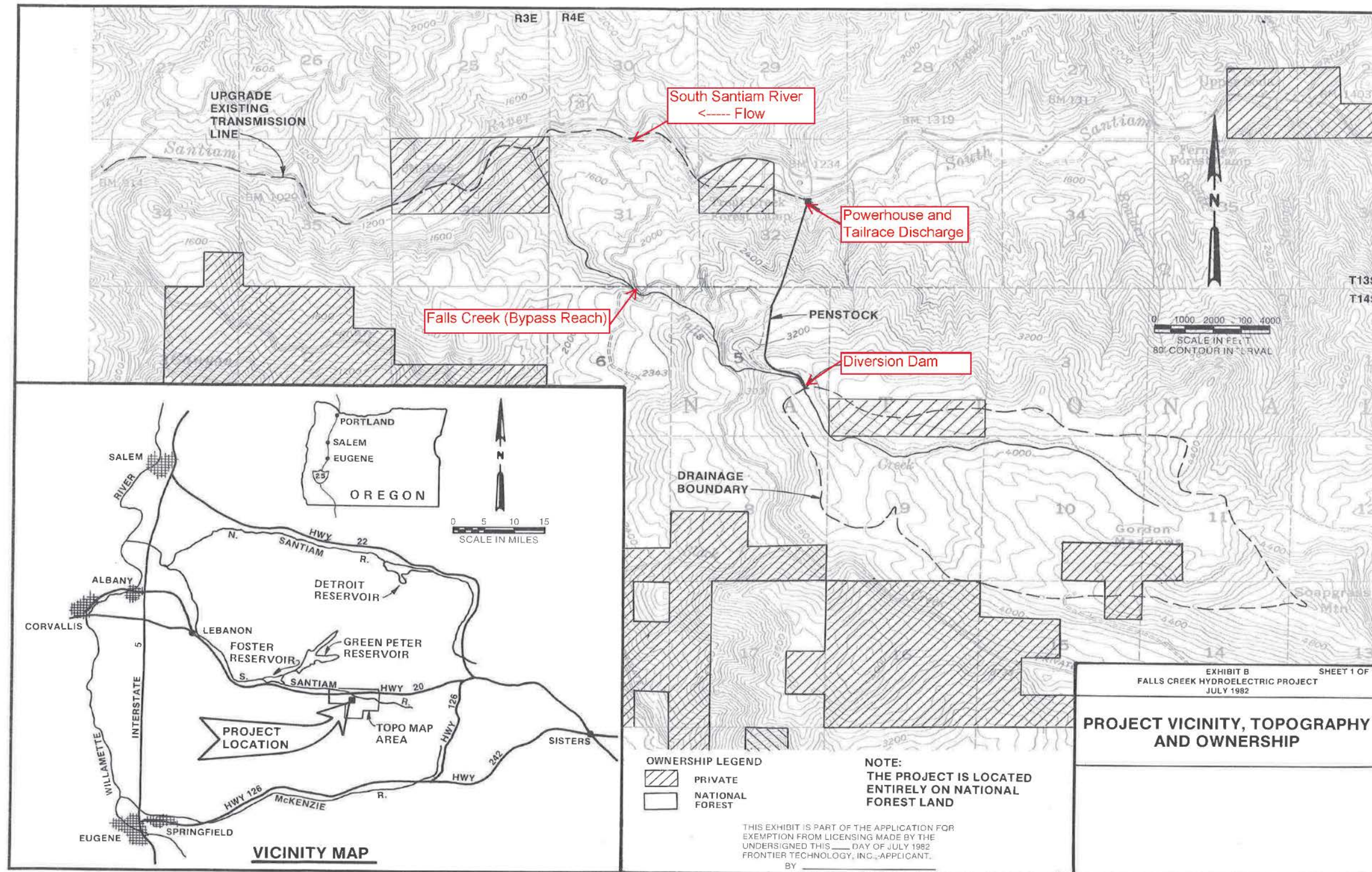


Figure 1: Project Location and Layout

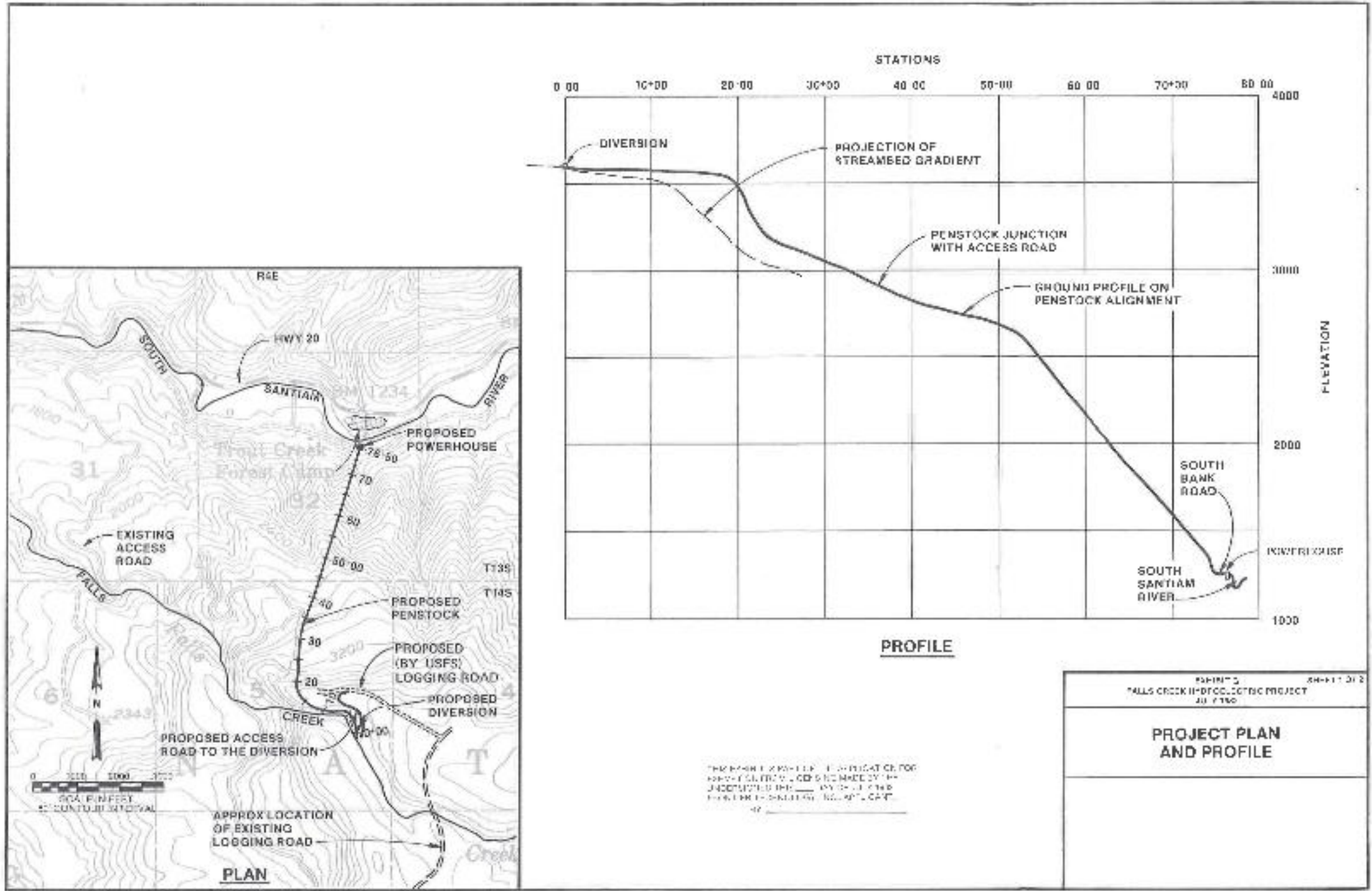


Figure 2: Project Topography and Elevation Cross Section

Part 1: Table B-1. FACILITY DESCRIPTION

Information for **FALLS CREEK HYDROELECTRIC PROJECT, L.P. (LIHI #4)**.

Information Type	Variable Description	Response (and reference to further details)
Name of the Facility	Facility name (use FERC project name if possible)	<i>Falls Creek Hydroelectric Project, Limited Partnership. FERC # 6661</i>
Location	River name (USGS proper name)	<i>Falls Creek-diverting stream</i>
	River basin name	<i>South Santiam River-receiving river</i>
	Nearest town, county, and state	<i>Cascadia, Linn, Oregon</i>
	River mile of dam above next major river	<i>Approximately 2.3 miles upstream from the confluence with the South Santiam River, Falls Creek creates a small pool (0.5 acres) from which the Facility diverts water into a penstock. Falls Creek does not operate a dam and there are no other dams located upstream or downstream on Falls Creek.</i>
	Geographic latitude	<i>44° 22' 46.7" N</i>
	Geographic longitude	<i>-122° 21' 3.3" W</i>
Facility Owner	Application contact names (IMPORTANT: you must also complete the Facilities Contact Form):	<i>Gary Marcus, General Partner Diane Moore, Administrative Assistant</i>
	- Facility owner (individual and company names)	<i>Gary Marcus</i>
	- Operating affiliate (if different from owner)	<i>N/A</i>
Regulatory Status	FERC Project Number, issuance and expiration dates	<i>FERC Exempt Generator, Project #6661-004. Original FERC Order granting exemption was issued March 4, 1983. An Order amending the exemption was granted on December 14, 1984. The Project was re-certified pursuant to documents dated March 20, 2006.</i>
	FERC license type or special classification (e.g., "qualified conduit")	<i>Exempt Generator</i>

Information Type	Variable Description	Response (and reference to further details)
	Water Quality Certificate identifier and issuance date, plus source agency name	<i>Letter of support from Oregon Department of Environmental Quality (ODEQ) (Exhibit 12 of the Project's original LIHI application) dated January 29, 2002, corroborates the compliance by Falls Creek with quantitative water quality standards. Per the state's water resources license, no other water quality issues are relevant.</i>
	Hyperlinks to key electronic records on FERC e-library website (e.g., most recent Commission Orders, WQC, ESA documents, etc.)	FERC Active Exemptions-#6661, Falls Creek H.P., L.P.: https://www.ferc.gov/industries/hydro/water/gen-info/licensing.asp USDA-Forest Service – Special Use Permit Authorization ID: WIL85 Contact ID: FALLS CREEK HYDRO Expiration Date: 12/31/2025 Use Code: 612
Power Plant Characteristics	Date of initial operation (past or future for operational applications)	<i>December 31, 1984</i>
	Total name-plate capacity (MW)	<i>4.1 nameplate; operating capacity 4.96.</i>
	Average annual generation (MWh)	<i>15,200</i>
	Number, type, and size of turbines, including maximum and minimum hydraulic capacity of each unit	<i>1 Gilkes Hydro Turbine, 34-inch Twin Jet, Horizontal Pelton type; rated 5701 BHP @ 2225 ft. net head, 6090 BHP @2269 ft., 26.4 CFS hydraulic capacity, 1200 RPM; S/N 56240.</i>
	Modes of operation (run-of-river, peaking, pulsing, seasonal storage, etc.)	<i>Diversion</i>
	Dates and types of major equipment upgrades	<i>Pelton runner replacement 2016. This replacement has had no effect on the Project operation. The energy output is essentially the same.</i>
	Dates, purpose, and type of any recent operational changes	<i>No recent operational change, other than the runner replacement.</i>
	Plans, authorization, and regulatory activities for any facility upgrades	<i>No facility upgrades are planned.</i>

Information Type	Variable Description	Response (and reference to further details)
Characteristics of Dam, Diversion, or Conduit	Date of construction	1983-1984; improvements to diversion screens/structure in 1993.
	Dam-Diversion height	5' height, approx. 30' length;
	Spillway elevation and hydraulic capacity	5' height at 3,596.0' elevation and 26.4 cfs.
	Tailwater elevation	1,210' elevation
	Length and type of all penstocks and water conveyance structures between reservoir and powerhouse	Buried penstock, 7,600 feet from point of diversion to powerhouse with varying 30" to 20" diameter.
	Dates and types of major, generation-related infrastructure improvements	None.
	Designated facility purposes (e.g., power, navigation, flood control, water supply, etc.)	Power
	Water source	Falls Creek, tributary of South Santiam River, NE ¼ SE ¼ Section 5, Township 14 South, Range 4 East, WM.
	Water discharge location or facility	South Santiam River, SW ¼ NE ¼ Section 32, Township 13 South, Range 4 East, WM, near river mile 57.5.
Characteristics of Reservoir and Watershed	Gross volume and surface area at full pool	Pool created by diversion structure is 0.5 acres, 3,596.5' normal elevation and 3,599.0' flood elevation. The pool area is irregular and approximately 105 feet wide by 207 feet in length. The diversion structure and the pond are covered by the Forest Service SUP.
	Maximum water surface elevation (ft. MSL)	3,599 M.S.L.

Information Type	Variable Description	Response (and reference to further details)
	Maximum and minimum volume and water surface elevations for designated power pool, if available	<i>For ten months out of the year the volume of the pond is 0.5 acres as the head level of the forebay is kept at -3 inches below the diversion. When there is additional water the value in the turbine opens and lowers the head level to -3 inches. When there is less water the valves in the turbine close and raise the head level to -3 inches. For about 60 days of the year there is more water than 26.4 CFS in Falls Creek that raises the pond level, but rarely more than another foot. Occasionally there are 5-or 10-year floods which might add 300 CFS to Falls Creek that might raise the pond 2 ½ feet. Photographs following Part I.</i>
	Upstream dam(s) by name, ownership, FERC number (if applicable), and river mile	<i>None</i>
	Downstream dam(s) by name, ownership, FERC number (if applicable), and river mile	<i>Foster Dam and Reservoir, River Mile 38.5 on the South Santiam River, owned by the Army Corp of Engineers.</i>
	Operating agreements with upstream or downstream reservoirs that affect water availability, if any, and facility operation	<i>N/A</i>
	Area inside FERC project boundary, where appropriate	<i>N/A</i>
Hydrologic Setting	Average annual flow at the dam	<i>16 cfs at the Diversion</i>
	Average monthly flows	<i>January – 22 cfs February – 19 cfs March – 22 cfs April – 25 cfs May – 23 cfs June – 15 cfs July – 9 cfs August – 3 cfs September – 3 cfs October – 4 cfs November – 21 cfs December 25 cfs</i>

Information Type	Variable Description	Response (and reference to further details)
	Location and name of relevant stream gauging stations above and below the facility	<p>No gauging stations are present on Falls Creek. There are no gauging stations on the South Santiam above Foster, Oregon. USGS 14185000 South Santiam below Cascadia, OR https://waterdata.usgs.gov/usa/nwis/uv?14185000 USGS 14187200 South Santiam River near Foster, OR https://waterdata.usgs.gov/usa/nwis/uv?14187200</p>
	Watershed area at the dam	South Santiam Watershed, Willamette River Basin
Designated Zones of Effect	Number of zones of effect	<p>Falls Creek Hydroelectric Project has three Zones of Effect.</p> <p>Zone 1: Impoundment and Forebay: the delimiting structures of Zone 1 are a 5' height 30' length weir and an 18" square sluice gate.</p> <p>Zone 2: Bypass: This zone begins at river mile 2.4 on Falls Creek and ends at the confluence of Falls Creek and the South Santiam River at approximately river mile 56.</p> <p>Zone 3: tailwater of the power plant on the South Santiam River near river mile 57.5.</p>
	Upstream and downstream locations by river miles	Upstream, Falls Creek river mile 2.4; downstream, South Santiam River near river mile 57.5.
	Type of waterbody (river, impoundment, by-passed reach, etc.)	Creek
	Delimiting structures	<p>Zone 1: Impoundment and Forebay: the delimiting structures of Zone 1 are a 5' height 30' length weir and an 18" square sluice gate.</p> <p>Zone 2: Bypass: This zone begins with the diversion structure at river mile 2.4 on Falls</p>

Information Type	Variable Description	Response (and reference to further details)
		<p><i>Creek and ends at the confluence of Falls Creek and the South Santiam River at approximately river mile 56.</i></p> <p><i>Zone 3: Tailwater: The tailwater, or tailrace, begins with the water exiting the powerhouse through a screen designed to prevent upstream fish passage, and continues through a landscaped concrete channel that looks like a stream until the water enters the South Santiam River near river mile 57.5.</i></p>
	Designated uses by state water quality agency	<i>Power generation</i>
Additional Contact Information	Names, addresses, phone numbers, and e-mail for local state and federal resource agencies	<i>Please see Part V - Contacts</i>
	Names, addresses, phone numbers, and e-mail for local non-governmental stakeholders	<i>Please see Part VI - Stakeholders</i>
Photographs and Maps	Photographs of key features of the facility and each of the designated zones of effect	<i>Please see Part VII - Project Photographs.</i>
	Maps, aerial photos, and/or plan view diagrams of facility area and river basin	<i>Please see Part VIII – Project Maps and Area Diagrams. See Vicinity photos that shows Falls Creek is 20 miles upstream of Foster Reservoir.</i>

Project Photographs for Part 1

Characteristics of Reservoir and Watershed - Maximum and minimum volume and water surface elevations for designated power pool, if available.



Minimum flows during operation

May 5, 2015 operating season photo; note fish bypass channel of 1 CFS, bottom left of photo.

Weir wall (right) with measure to monitor flow over the weir wall.



Maximum Flows during operation (**left**)

November 19, 2015

Part II: STANDARD MATRICES

Falls Creek Hydroelectric Project has three Zones of Effect.

Zone 1: the diversion structure and the impoundment.

Zone 2: the bypass reach

Zone 3: the tailrace.

Each zone is considered in turn with its own Criterion matrix.

Facility Name: *Falls Creek Hydroelectric Project*

Zone 1 of Effect: Impoundment

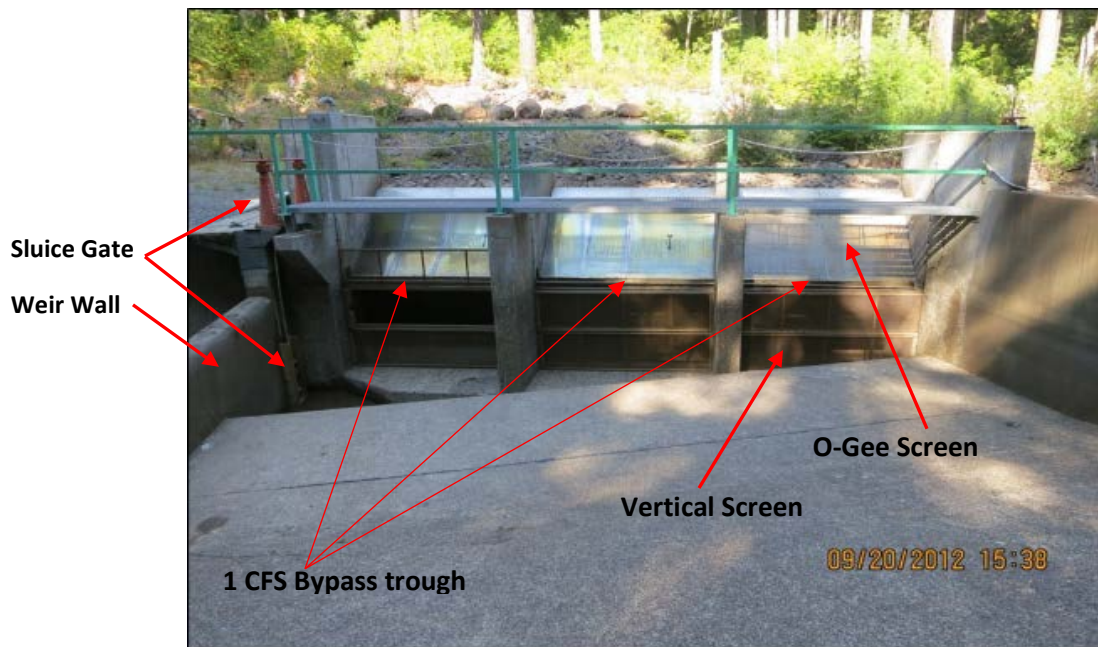
Criterion		Alternative Standards				
		1	2	3	4	Plus
A	Ecological Flow Regimes		X			
B	Water Quality	X				
C	Upstream Fish Passage	X				
D	Downstream Fish Passage	X				
E	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection		X			
G	Cultural and Historic Resources Protection		X			X
H	Recreational Resources	X				

The first zone is the impoundment. This zone is a small pond created by the diversion, approximately 105 feet by 207 feet and varying depths up to 5 feet. Zone 1 runs from the diversion to approximately 207 feet upstream of the diversion. This zone begins at approximately river mile 2.35 on Falls Creek with the diversion structure. The delimiting structures of Zone 1 are a 5' height 30' length weir and an 18" square sluice gate, pictured on the far left in the following photograph.

Falls Creek is a tributary to the South Santiam River in Linn County, Oregon. According to the most recent studies, the stream supports resident populations of Brook trout along its entire length. Anadromous fish species access to Falls Creek is limited to the 500-foot reach above its confluence with the South Santiam River. Passage above this point is blocked by a 40 to 50-foot high waterfall. Previous surveys in 1973, 1977, 1982, and, most recently in 2017, indicated that Falls Creek has little or no potential for anadromous fish production. Although anadromous fish could gain access to the lower 500 feet of the stream, the substrate in this reach is composed of small boulders, large cobble and bedrock which is not suitable anadromous fish spawning material. The surveys also indicated that there is a wide variation in the quality of the fish habitat along the upper reaches of Falls Creek upstream of the impoundment. The habitat upstream of the project's impoundment is unaffected by the project. These upper reaches of Falls Creek that are not affected by the project have a moderate gradient, a good pool to riffle ratio, good trout spawning gravels and ample fish cover. The lower reach (Zone 2 - the bypass reach) is characterized by a steep gradient, numerous waterfalls (most exceeding 15 feet in height), poor

trout spawning gravels and little cover. The best quality trout habitat along the lower reach is in the plunge pools below the waterfalls; the sections between the waterfalls are generally too shallow and swift to provide good trout holding areas. In 1982, USFS set a condition for a minimum flow of at least 1.0 cfs at the diversion point to maintain aquatic habitat downstream from the impoundment. Ground water spring and seep contributions along the lower reaches add to the minimum 1.0 cfs flow so that the discharge at the mouth of Falls Creek is maintained at or above 2.0 cfs.

ODFW staff conducted fish surveys for the Project site in early September 2017 and determined that native migratory fish are not present upstream from the natural fish passage barrier, which includes the stream reach where the diversion is located. Native migratory fish as observed and documented in past survey's by ODFW and the United States Forest Service are however present in the lower Falls Creek bypass reach from the second road crossing below the diversion site downstream to the confluence of the South Santiam River. The lower most 0.1 mi. of the Falls Creek bypass also provides rearing habitat for steelhead. ODFW staff determined that because native migratory fish are not present now and have not historically inhabited the site upstream from the natural fish passage barrier, which includes the stream reach where the diversion is located, the Oregon Fish Passage Policy (ORS 509.585) is not triggered.



(Above) Diversion structure, after cleaning during summer maintenance, showing the three 8' O-Gee self-cleaning fish screens on top, the vertical screens in front of the penstock entry, and the 1 cfs fish release and trash tray at the toe of the O-Gee screens.

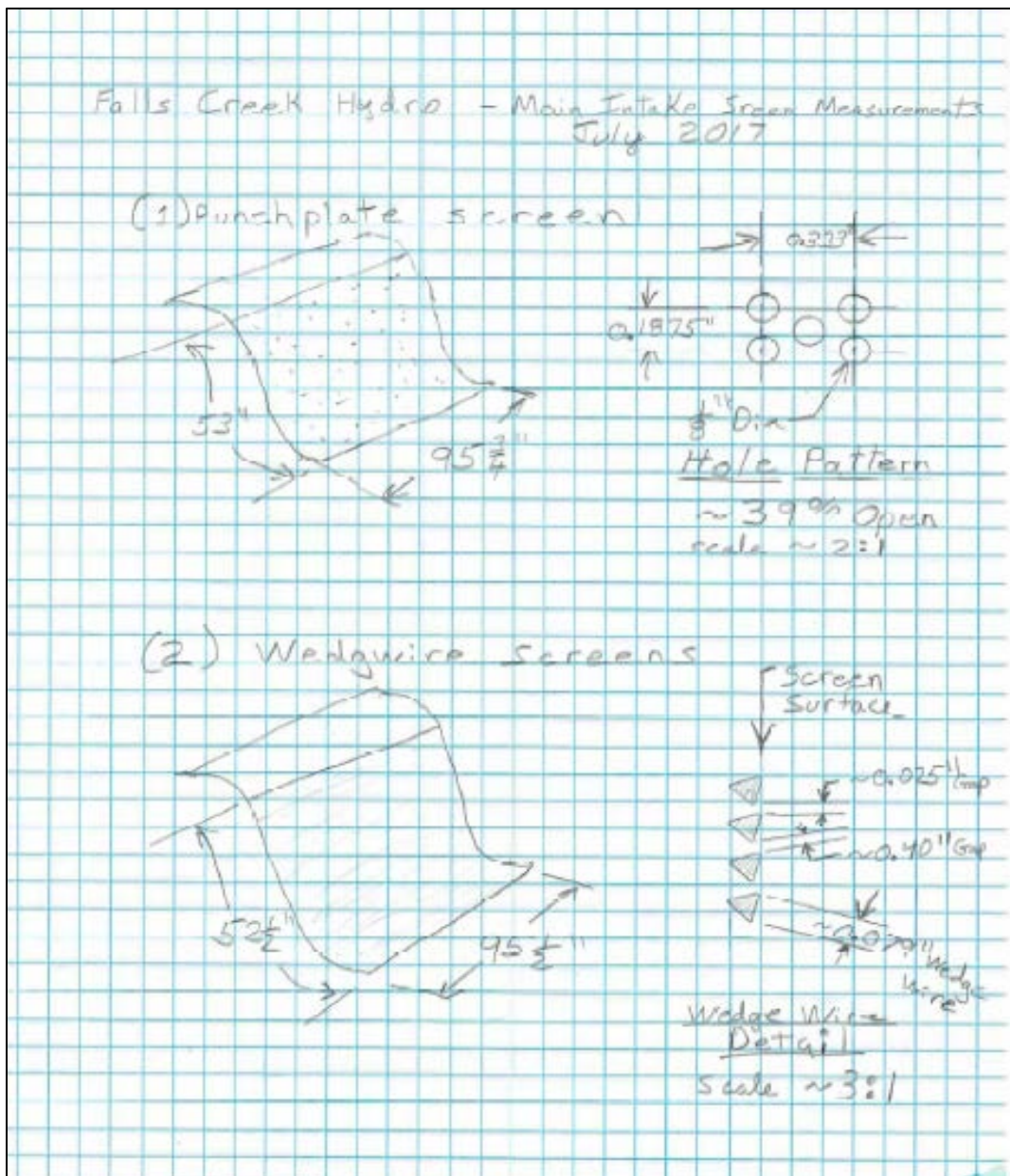
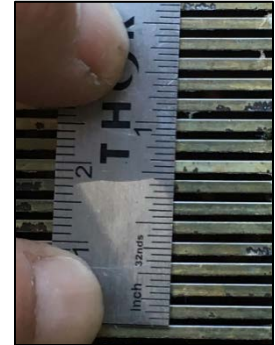
There are three bays on the diversion structure, pictured above. Each bay has an O-Gee screen on top that allows passage of intake water for the penstock but excludes fish and debris which are washed over its surface into a trash rack at the base of the screens, or into the forebay area. There are also two vertical screens at the bottom of each bay that screen the head level pond and allow for fluctuations in the head level.

The vertical screens, six (6) in total, are described in the CH2M Hill original "as built" drawings as 8' 3" long by 2' 1/2" high, #3 stainless steel standard grade wire cloth, type 304 wire with a diameter of 0.08", 67.6% CLR screen OPNG.



Two of the bays have an O-Gee shaped wedge-wire assembly for the upper intake screens (shown to the right).

One of the bays has an O-Gee shaped punch plate for its intake screen (shown on the left.) The sketch on the following page provides the details for both sets of screens.





(Above) View of Falls Creek, looking upstream from diversion. This is the impoundment area.

(Below) Falls Creek upstream from diversion in June, prior to hydro shutdown for season.





Water bypass channel of 1 CFS, above and right. Notice little to no water flowing over weir wall due to low flows in Falls Creek.



Falls Creek upstream of diversion structure during summer season, above and right; plant is non-operational due to low flows.



Criterion	Alternative Standards				
	1	2	3	4	Plus
A Ecological Flow Regimes		X			
B Water Quality	X				
C Upstream Fish Passage	X				
D Downstream Fish Passage	X				
E Watershed and Shoreline Protection	X				
F Threatened and Endangered Species Protection		X			
G Cultural and Historic Resources Protection		X			X
H Recreational Resources	X				

The bypass reach, Zone 2, begins immediately downstream of the diversion structure. It is a 2.4-mile bypass that ends when Falls Creek joins the South Santiam River, approximately river mile 56. Within 30 feet from where Falls Creek enters this bypass reach, it immediately goes under large boulders and then drops out of sight in a very steep grade. Falls Creek is characterized by numerous small falls (most over 15 feet in height) and plunge pools. The only possible habitat for fish is in these plunge pools. During the driest summer months of August and September there is only approximately ½ CFS of water flowing through these pools, so fish habitat is limited. In addition, virtually no sunlight penetrates to these pools because of the near complete canopy of trees. Therefore, very little algae can grow as food for flies. Algae growth is further hindered by the extremely soft water in Falls Creek, which contains so few minerals that a salt block must be placed in the water to conduct electrofish testing. Algae therefore has very little opportunity for growth because of the low mineral content of the water and limited sunlight, thereby eliminating a necessary food source that benefits fish populations.

Since Falls Creek does not operate, on average, from July 10 to November 1, there are approximately four months out of the year when the project has no effect on the bypass reach. Therefore, these criteria apply to the average eight months of the project’s operations, roughly November 1 through July 10.



Falls Creek, approx. river mile 2.4, in late June. Just downstream, the creek flows under large boulders, then underground, and continues over a series of falls, most exceeding 15 feet in height.

Water exiting diversion structure, river mile 2.4 in winter.



Summer – Falls Creek just downstream from river mile 2.4, where the creek flows underground.





Falls Creek, FS RD 3024, 1st road crossing during winter.





Falls Creek at Gordon Lakes Trailhead, June 12, 2014



Falls Creek between Gordon Meadows Trailhead and 2nd crossing of FS RD 3024, November 3, 2011.



Fish passage in the lower reach of Falls Creek, pictured left, is limited to 500-feet where the creek is blocked by a high waterfall and large boulders at its base.



Falls Creek entering South Santiam River at FS Road 3024. High water November 3, 2011, river mile 56.



Criterion	Alternative Standards				
	1	2	3	4	Plus
A Ecological Flow Regimes		X			
B Water Quality	X				
C Upstream Fish Passage	X				
D Downstream Fish Passage	X				
E Watershed and Shoreline Protection	X				
F Threatened and Endangered Species Protection		X			
G Cultural and Historic Resources Protection		X			X
H Recreational Resources	X				

Zone 3: Tailrace

The tailwater or tailrace, begins Zone 3 with the expended water exiting the powerhouse through a screen designed to prevent fish passage, and continues through a landscaped concrete channel that looks like a stream. The water enters the South Santiam River, near approximately river mile 57.5. The tailrace is dry for four months out of the year, since Falls Creek does not operate – on average – from approximately July 10 to November 1. The following pictures below show that the tailrace is less than 100 yards long.



Water exiting the turbine passes through a gated pipe into a concrete and rock-lined tailrace, made to mimic a natural stream. The gated pipe reduces the possibility of anadromous fish, attracted to the discharge, from entering the powerhouse.

Part III: SUPPORTING INFORMATION

Contained in this section is documentation that explains and justifies the standards selected to pass the LIHI certification criteria. (Please refer to Part II.)

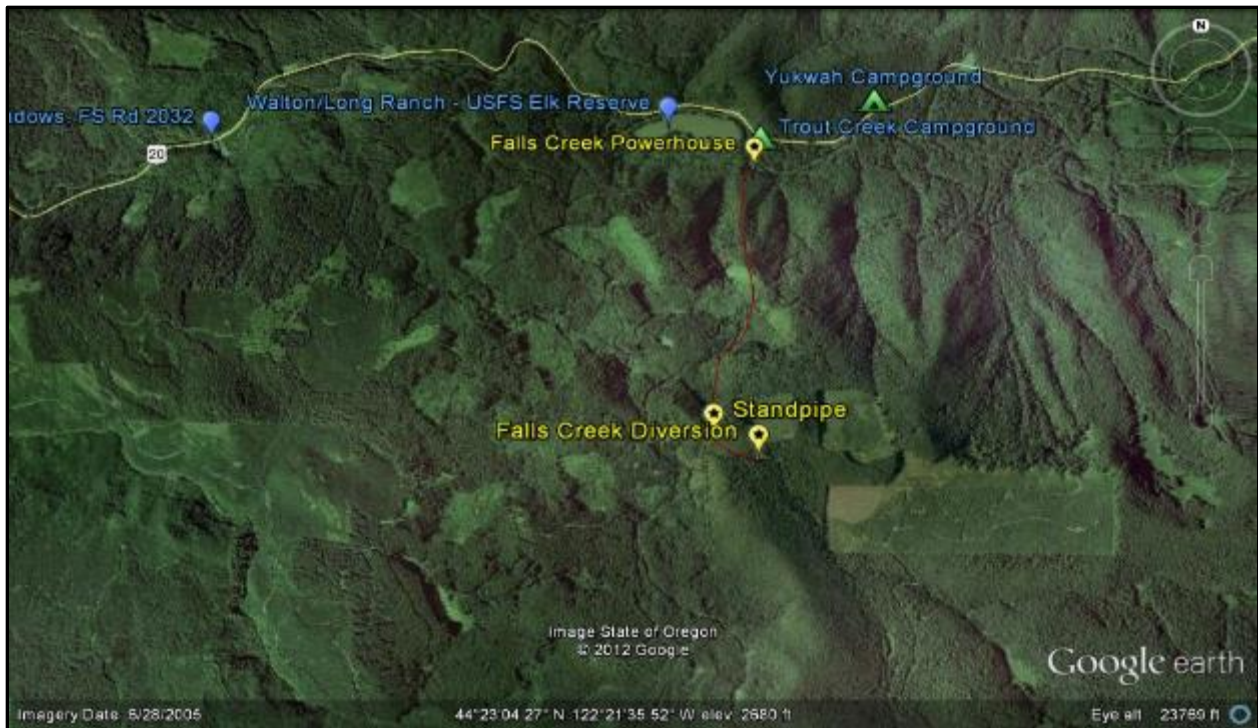
III.B.2.1. Ecological Flow Standard for Zones 1, 2, and 3

Table B-2. Information Required to Support Ecological Flows Standards

Criterion	Standard	Instructions
A	2	<p><u>Agency Recommendation (see Appendix A for definitions):</u></p> <ul style="list-style-type: none"> • Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent). • Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement. • Explain how the recommendation relates to agency management goals and objectives for fish and wildlife. • Explain how the recommendation provides fish and wildlife protection, mitigation and enhancement (including in-stream flows, ramping and peaking rate conditions, and seasonal and episodic instream flow variations).

The Falls Creek Hydroelectric Project is a Diversion operation. We are a FERC “Exempt Facility” that utilizes an existing water feature for head – Falls Creek and have a capacity of less than 5 megawatts. (See Exhibit 4 of the original LIHI application.) Falls Creek is a small stream with average stream flow of 16 CFS. Stream flow is frequently below 1 CFS during the months of July, August, September and October. Since the Project needs a minimum of approximately 2 CFS to operate and must release 1 CFS into the stream per its permit requirements with the Oregon Water Resources Department and as proposed in the original FERC exemption application, the Project does not operate during low water months. Falls Creek is referred to by the USDA Dept. of Forestry as “a model for little or no impact to the forest and aquatic environments.” Regarding the question of flows, “the Falls Creek facility does not adversely affect instream flows in either Falls Creek, or the South Santiam River. This facility has no adverse effect on terrestrial or aquatic species.” (See Exhibit 11 of the original LIHI application.)

Location of the powerhouse (1,210' elevation) relative to the diversion (3,591' elevation).



In Zones 1 and 3, the project is operated in a run-of-river fashion when sufficient inflows are available above the required 1 cfs minimum flow. In Zone 1, the pool is temporarily lowered for a day or two for maintenance and repairs during the summer when the powerhouse is not operating. If there has been major damage to the diversion structure, the forebay elevation may be lowered for longer periods of time. During these times, all Falls Creek flows are spilled into the bypassed reach. See Attachment A, 2018 Oregon Water Resources Department (OWRD) Proposed Final Order, which also recommends that the forebay be maintained at full pool, as inflow allows, from early summer through early fall low-flow conditions for the benefit of wildlife resources which may inhabit the area. During low flow periods there is no discharge from the tailrace (Zone 3) since all inflow is discharged into the bypass reach.

In Zone 2, the 1 cfs minimum flow was originally proposed in the FERC exemption application (Exhibit 3 of the 2002 LIHI application) and was based on an analysis of daily stream flows over a 20-year period which showed natural inflows in July, August, September and October to range from 1 to 4 cfs at the point of diversion. This minimum flow was affirmed by the Oregon Department of Fish and Wildlife in their September 1982 letter (see FERC exemption application) and stated: "The proposed bypass flow of 1 cfs...is acceptable to the Department, based on Mr. Hunt's measurement and assessment of stream flows sustaining fish live below the project."

Around the time of the FERC exemption application (p. E-9), habitat surveys identified pool and riffle habitat in Falls Creek and the presence of trout and food organisms such as stoneflies and mayflies, but little potential spawning habitat except for in some parts of the upper reach. Little to no potential for anadromous fish production was found upstream of the lowest 0.1 mile of Falls Creek.

The 2018 Oregon Water Resources Department (OWRD) Proposed Final Order for reauthorization of the Project's state water right for hydropower also re-affirms that the current 1 cfs minimum flow is adequate, and this serves as the most recent agency recommendation, with the same scientific/technical basis as used in the original FERC license exemption application. The OWRD 2018 proposed final order recommends no additional bypass flows since water use is discontinued during the low flow times of the year. That order also notes poor fish habitat due to steepness and substrate consisting mainly of bedrock and large boulders.

The required minimum flow is monitored via Falls Creek's diversion structure which contains a self-regulating orifice that was incorporated into the weir to provide the 1 CFS flow past the point of diversion and screens at the project's intake, as shown in the photograph below. The opening is designed to pass 1 CFS. The cleaning trough has a carrying capacity of 1 CFS. Therefore 1 CFS flows through into Falls Creek. Water greater than 1 CFS spills into the forebay. (In its letter of November 24, 1982, the Department of Fish and Wildlife set the following condition for minimum flow: "The Project owner shall continuously maintain a streamflow of at least one cubic foot per second in the natural channel of Falls Creek, from the Project intake at stream mile 2.35 downstream to the confluence of Falls Creek with the South Santiam River. The specified flow shall be measured and maintained in the natural channel of Falls Creek at the Project intake by means of a calibrated, self-regulating weir installed by the project owner.")



The gate for the one (1) CFS water bypass is pictured here in a closed position during summer maintenance. After maintenance ends, this gate is opened, locked in position, and remains open until the following maintenance season.

The bypass trough flows along the base of the O-Gee upper screens, then connects to the cement parapet where a channel was created in the cement for the water flow. The trough always holds 1 CFS if the flows are high enough to reach the opening gate. The picture below shows the water exiting the 1 CFS bypass in the weir wall.



III. B.2.2. Water Quality Standards in Zones 1, 2, and 3

Table B-3. Information Required to Support Water Quality Standards

<i>Criterion</i>	<i>Standard</i>	<i>Instructions</i>
B	1	<p><u>Not Applicable/DeMinimis Effect:</u></p> <ul style="list-style-type: none"> • If facility is located on a Water Quality Limited river reach, provide an agency letter stating that the facility is not a cause of such limitation. • Explain rationale for why facility does not alter water quality characteristics below, around, and above the facility.

Zones 1, 2 and 3 all meet Standard B-1. Falls Creek is not listed as impaired according to the latest Oregon Impaired Waters List (from 2012) for streams within the South Santiam basin (there is another stream named Falls Creek located in the Lower Columbia basin). However, there is a Willamette TMDL and a related Water Quality Restoration Plan in place for temperature that includes the South Santiam. That TMDL is managed in part by the Willamette National Forest.

The Falls Creek Project follows the quantitative water quality standards established by the state that support designated uses pursuant to the federal Clean Water Act. The determination was made as part of the FERC application and approved as part of the exemption that the Facility would have no impact on water quality above or below the diversion. The recent letter of support from Oregon Department of Environmental Quality (ODEQ) follows on the next page and corroborates the compliance by Falls Creek with quantitative water quality standards. There are no water rights of record and no known water uses on Falls Creek above or below the diversion.

Exhibit 12 of the original LIHI application contains documentation from the Oregon DEQ stating, per agency pollution complaint logs and periodic water quality monitoring site summaries near the South Santiam River, “there is no history of pollution complaints regarding Frontier Technology, Inc. and the hydropower development. These records date back to at least 1994. Records of routine water quality measurements indicate no adverse water quality effects have been noted in the South Santiam River that might be attributed to the Falls Creek hydroelectric project.”

The 2018 OWRD Proposed Final Order reaffirms the lack of impact by the project on water quality, and states: “No significant temperature-related problems have been identified nor are suspected...As the entire penstock is buried, there is little opportunity for significant water temperature-related problems”

1. Agency letter from Chris Stine, PE Hydroelectric Specialist with Oregon Department of Environmental Quality follows.



Oregon

Kate Brown, Governor

Department of Environmental Quality
Northwest Region Portland Office/Water Quality
700 NE Multnomah Street, Suite 600
Portland, OR 97232
(503) 229-5263
FAX (503) 229-6957
TTY 711

Diane Moore
Frontier Technology, Inc.
Falls Creek Hydro Project, L.P.
P.O. Box 23508
Eugene, OR 97402

November 8, 2017

RE: Falls Creek Hydropower Project, Project No. HE 410
LIHI Water Quality Determination

Dear Ms. Moore,

The Oregon Department of Environmental Quality submits the following information in response to the Low Impact Hydro Institute Water Quality Questionnaire regarding operation of the Falls Creek Hydro Project.

Question B.1.a: *Is the Facility in Compliance with all conditions issued pursuant to a Clean Water Act Section 401 water quality certification issued for the Facility after December 31, 1986?*

DEQ Response: NA. Falls Creek Hydro received a FERC license exemption. For this reason, the project is not required to obtain water quality certification from DEQ under section 401 of the federal Clean Water Act.

Question B.2: *Is the Facility area or the downstream reach currently identified by the state as not meeting water quality standards (including narrative and numeric criteria and designated uses) pursuant to Section 303(d) of the Clean Water Act?*

DEQ Response: YES. The South Santiam River at the confluence with Falls Creek is listed as impaired for temperature.


Question B.3: *If the answer to question B.2 is yes, has there been a determination that the Facility is not a cause of that violation?*

DEQ Response: YES. On July 25, 2017 DEQ staff recorded temperature data above the project diversion, in the tailrace below the project diversion, in Falls Creek just above the confluence with the South Santiam River, and in the South Santiam River upstream of the confluence. Temperature in Falls Creek ranged from 13.0 to 14.5 C which is below the biologically based numeric criteria of 16 C. Temperature in the South Santiam River was 16.8 C. Although the project was not operating during while these measurements were recorded, discharge to the tailrace was estimated at 1 cubic foot per second which is similar to discharge under normal operation. Further, measurements were recorded in late July during seasonally low flow and seasonally high temperature conditions.

Although no long-term record of continuous temperature data exists for Falls Creek, the measured stream temperature was well below the biologically based numeric criterion and suggests normal project operation does not contribute to temperature impairment of the South Santiam River.

Please feel free to contact me if you would like to discuss this information further.

Sincerely,



Christopher Stine, PE
Hydroelectric Specialist

Cc: Gary Marcus, Frontier Technologies
DEQ, file

III. B.2.3. Upstream Fish Passage Standards in Zones 2 and 3

Table B-4. Information Required to Support Upstream Fish Passage Standards.

Criterion	Standard	Instructions
C	1	<p>Not Applicable / De Minimis Effect:</p> <ul style="list-style-type: none"> • Explain why the facility does not impose a barrier to upstream fish passage in the designated zone. • Document available fish distribution data and the lack of migratory fish species in the vicinity. • If migratory fish species have been extirpated from the area, explain why the facility is or was not the cause of this.

Fish species that are or may be currently or historically present in the project vicinity include: resident Brook, Rainbow and Cutthroat trout, and anadromous (and some potential resident populations of) Chinook salmon and Steelhead trout. At the time of the FERC exemption application, the USFWS found no anadromous species in Falls Creek, nor any spawning grounds. Oregon DFW found some hatchery trout at the mouth of Falls Creek, some wild Rainbow and Brook trout in the creek (from the FERC exemption application page E-12).

More recent surveys conducted in 2017 found only 2 Brook trout in the diversion pool in Zone 1 and no trout in the bypass reach or the tailrace area. Unspecified species of “native migratory fish” were found in the lowest portion of the Creek and Steelhead rearing habitat was observed in the lowest 0.1 mile above the confluence with the South Santiam River (see OWRD 2018).

The upstream passage criterion does not apply in Zone 1, the impoundment zone, since once upstream of a project dam there is no impact on upstream migrating fish. In addition, there are not presently or historically any anadromous species above the natural fish barrier located just downstream of the diversion structure (see OWRD 2018).

In Zone 2, the 2.35-mile reach of Falls Creek below the diversion (bypass reach) has an extreme gradient, is generally inaccessible by fish and contains numerous falls that prevent anadromous fish migration upstream. Falls Creek does provide habitat for resident trout throughout its length. No trout or other species, including migratory species, were found in the 2017 survey in Zone 2. Winter steelhead and spring-run Chinook salmon both occur in the South Santiam River and in the very lowest portion of Falls Creek where the gradient is not as steep (see Figure 2, Page 5). There is rearing habitat for steelhead in the lowest 0.1 mile, but upstream migration is limited by natural falls at that point so there is very little habitat available overall (see photograph page 22). The Project’s agreement with the Department of Fish and Wildlife provides for the maintenance of a flow of one cubic foot per second past the point of diversion and screens to protect fish life in Falls Creek. No mandatory fish passage prescriptions have been issued by resource agencies. (See Exhibits 5, 6, 7, 10 and 11 of the original LIHI application.) Section III.B.2.1. of this recertification application includes photographs illustrating the bypass channel. And, Part II, Zone 1: Impoundment, contains photographs and descriptions of the fish screens. No new fish species have been found in the Bypass Reach.

In Zone 3, no fish were found in the 2017 survey. However, resource agencies recommended at the time of construction that a screen be installed in the tailrace to prevent fish from trying to swim into the tailrace pipe when the Facility was being constructed. A screen was installed and continues to be in use. No other recommendations have been issued. (See Exhibits 5, 6, 7, 10, and 11 of the original LIHI application.) Part II, Zone 3: Tailrace of this application contains photographs of the installed screen (page 24). Even if fish were able to enter the powerhouse, the penstock is too long and the gradient too steep to allow for successful passage into the diversion pool. This is like the steep gradient in Falls Creek that also precludes upstream passage. Therefore, it is natural features and not the Project that pose barriers to upstream passage.

III. B.2.4. Downstream Fish Passage and Protection Standards in Zones 1 and 2

In all cases, the applicant shall list all fish species (for example, riverine, *anadromous*, *catadromous*, and *potamodromous*) that occur now or have occurred historically in the area affected by the Facility.

Table B-5. Information Required to Support Downstream Fish Passage Standards.

<i>Criterion</i>	<i>Standard</i>	<i>Instructions</i>
D	1	<p><u>Not Applicable / De Minimis Effect:</u></p> <ul style="list-style-type: none"> • Explain why the facility does not impose a barrier to downstream fish passage in the designated zone, considering both physical obstruction and increased mortality relative to natural downstream movement (e.g., entrainment into hydropower turbines). • For riverine fish populations that are known to move downstream, explain why the facility does not contribute adversely to the sustainability of these populations or to their access to habitat necessary for successful completion of their life cycles. • Document available fish distribution data and the lack of migratory fish species in the vicinity. • If migratory fish species have been extirpated from the area, explain why the facility is or was not the cause of this.

As noted above, there are no migratory species currently or historically present above the natural fish barrier that would require downstream passage at the project. The very limited number of trout found in the reservoir could move downstream and the safety of downstream passage from the diversion (Zone 1) is addressed in the OWRD Proposed Final Order. It requires that the fish screening be maintained and kept free of debris. The intake screens include a punch plate screen with 1/8-inch diameter holes and wedge wire screens with gaps ranging from 0.08 inches to 0.4 inches wide.

The Project’s agreement with the Department of Fish and Wildlife provides for the maintenance of a flow of one cubic foot per second past the point of diversion and screens to protect fish life in Falls Creek. No mandatory fish passage prescriptions have been issued by resource agencies.

For Zone 3, the tailrace zone, the downstream passage criterion is not applicable since once past a project into the tailrace zone there is no additional barrier to passage. Furthermore, the Project discharge from the tailrace enhances fish habitat in the section of the South Santiam River between the tailrace and Falls Creek confluence by discharging water about 2 miles upstream from where it would have naturally entered the river.

III. B.2.5. Shoreline and Watershed Protection Standards in Zones 1, 2, and 3

Table B-6. Information Required to Support Shoreline and Watershed Protection Standards.

<i>Criterion</i>	<i>Standard</i>	<i>Instructions</i>
E	1	<p><u>Not Applicable / De Minimis Effect:</u></p> <ul style="list-style-type: none"> • If there are no lands with significant ecological value associated with the facility, document and justify this (e.g., describe the land use and land cover within the project boundary). • Document that there have been no Shoreline Management Plans or similar protection requirements for the facility.

Standard E-1 was chosen for all three Zones.

There is no requirement for a shoreline management plan for the project. The Falls Creek Project is located entirely on National Forest lands with moderate to steep gradient. The Project is outside of federally designated Wilderness Areas. While there was existing access to the powerhouse site and to points along the penstock route, access at the diversion had to be developed during construction. In Zone 1, the diversion structure impounds a small pool approximately 105 feet wide by 207 feet in length and varying depths up to 5 feet. As noted above, the 2018 OWRD Proposed Final Order recommends that the forebay be maintained at full pool, as inflow allows, from early summer through early fall low-flow conditions for the benefit of wildlife resources which may inhabit the area.

The diversion structure, pond, penstock, and powerhouse are covered by the Forest Service SUP. All activities on the 6.5 acres of project lands are authorized under the USFS SUP, including an Operations and Maintenance (O&M) Plan (Exhibit A of the SUP¹). The O&M Plan includes provisions for vegetation management, road maintenance, and maintenance of signage. The land around the project includes existing Forest Service roads and is managed for timber resources in locations where steepness does not preclude cutting.

In Zone 2, the 2.35-mile reach of Falls Creek below the diversion is generally inaccessible due to steepness. (See Exhibits 4 and 5 of the original LIHI application.) In Zone 3, the Tailrace Zone, spent water from the turbine exits the Project through a screened tailrace, flowing through a short man-made streambed into the South Santiam River. Other than the screen on the tailrace pipe, there are no shoreline or watershed protection standards required of the Project. The powerhouse is circled by an earthen berm, planted with shrubbery and trees for camouflage, to deaden noise and prevent it carrying

¹ The SUP was most recently updated in 2006 and was submitted with the revised LIHI application.

across the river to campers using the facilities at Trout Creek Campground. The Old Santiam Wagon Road, an Oregon historical roadway, runs directly in front of the powerhouse. Access to this roadway is behind a locked Forest Service gate and not accessible by the public, other than by foot. The Project’s SUP agreement with the Forest Service dictates maintenance, repair, and use of this historic roadway.

No part of the project area is designated by USFS as having any significant ecological value. In their September 1982 comment letter on the FERC exemption application, Oregon Department of Fish and Wildlife stated: “With respect to land management, careful attention should be given in the routing and location of access roads, penstock and other project facilities to avoid habitat with local significance to fish and wildlife; e.g., streams, areas of riparian vegetation, marshy areas and seeps, and rock outcroppings. Such areas, although usually minor in extent, are necessary for maintaining local abundance and diversity of wildlife.”

The state and federal agencies did not provide additional agency recommendations as part of the FERC Licensing exemption process. No agency recommendations were issued regarding watershed protection. Per the Project’s FERC exemption amendment: “No significant impacts will result from approval of this amendment.”

III. B.2.6. Threatened and Endangered Species Standards in Zones 1, 2, and 3

In all cases, the applicant shall identify all listed species in the facility area based on current data from the appropriate state and federal natural resource management agencies.

Table B-7. Information Required to Support Threatened and Endangered Species Standards.

<i>Criterion</i>	<i>Standard</i>	<i>Instructions</i>
F	3	<p><u>Recovery Planning and Action:</u></p> <ul style="list-style-type: none"> If listed species are present, document that the facility is in compliance with relevant conditions in the species recovery plans, incidental take permits or statements, biological opinions, habitat conservation plans, or similar government documents. <p>Document that any incidental take permits and/or biological opinions currently in effect were designed as long-term solutions for protection of listed species in the area.</p>

Three state or federal endangered or threatened species are or may be present within the Project area. Winter Steelhead and spring-run Chinook salmon are federally listed as threatened in the Upper Willamette River, but not separately state listed. Both occur in the South Santiam River. The lower 0.1 miles of Falls Creek provides potential rearing habitat for Steelhead, but they cannot pass upstream of the falls located there. There is a joint state/federal Upper Willamette River Conservation and Recovery Plan that encompasses both species in the region that includes the project.² This Recovery Plan serves

² <https://repository.library.noaa.gov/view/noaa/15981>. Note that the “Fall Creek” listed in the document is not the same Falls Creek that the project is located on.

as both a recovery plan under the Federal Endangered Species Act (ESA) and as a State of Oregon conservation plan under Oregon's Native Fish Conservation Policy (NFCP). There is no incidental take permits or Biological Opinions in effect for the Project. The Project is in compliance with the recovery plan in that there are no provisions in the plan that are applicable to the Project or its operations.

The Northern Spotted Owl is also present in the Project area. This species is state and federally threatened and is subject to a federal recovery plan.³ Item I of the Project's current USDA-FS Special Use Permit states that location of areas needing special measures for protection of plants or animals listed as threatened or endangered or sensitive may be shown on a separate map within the SUP; however, no map is included, nor any mention of specific restrictions, other than to remove "non-native plants" in project areas. Brian McGinley, the previous USFS Regional Forester, instructed that nesting season for the Northern Spotted Owl generally occurs from about February (courtship) to June (fledging), and parental care of the young owlets can extend into September, when young owls begin to disperse from the area. He requested that noise levels be kept down in spring through June when nesting is taking place.⁴

A 20-foot corridor of trees was removed for the construction of the penstock, then recovered. Potential impacts to Northern Spotted Owl were not assessed during construction because the species was not listed at the time. The existing penstock corridor is maintained in a natural vegetative state with herbaceous ground cover and saplings and fallen logs so as not to demarcate the corridor.

All threatened and endangered species are managed and monitored under the Willamette National Forest Plan and periodic monitoring reports that are developed as part of that Plan⁵ and subject to conditions in the SUP.

³ <https://www.fws.gov/oregonfwo/Species/Data/NorthernSpottedOwl/Recovery.asp>

⁴ The SUP renewal was negotiated with Brian McGinley beginning in 2004 and worked on for over a year. I do not have any statement about the Spotted Owl in writing from Brian. The comment to keep noise down during nesting season was made verbally during an on-sight meeting in 2005 and merely a comment of preference by Brian, but we've kept it in mind each year and honor the request.

⁵ https://www.fs.usda.gov/detail/willamette/landmanagement/planning/?cid=fse_030883

III. B.2.7. Cultural and Historic Resources Standards in Zones 1, 2, and 3

In all cases, the applicant shall identify all cultural and historic resources that are on facility owned property or that may be affected by facility operations.

Table B-8. Information Required to Support Cultural and Historic Resources Standards.

Criterion	Standard	Instructions
G	2	<u>Approved Plan:</u> <ul style="list-style-type: none"> • Provide documentation of all approved state, provincial, federal, and recognized tribal plans for the protection, enhancement, and mitigation of impacts to cultural and historic resources affected by the facility. • Document that the facility is in compliance with all such plans.
G	PLUS	<u>Bonus Activities:</u> <ul style="list-style-type: none"> • Document any substantial commitment that the facility has made to restoring one or more significant cultural or historical resource in the vicinity, beyond what is required in existing plans such as a Historic Resources Management Plan. • Document any significant new educational opportunity about cultural or historical resources in the area that the Facility has created, including contractual obligations that guarantee that this opportunity will exist for the duration of the LIHI certification.

Standard G-2 applies to all three Zones. There are no specific requirements regarding cultural resource protection within the Project’s FERC exemption. Appropriate surveys and research by qualified anthropologists were conducted prior to construction as part of the exemption application. No archaeological sites were found as part of these surveys. The penstock crosses under the Old Santiam Wagon Road, an historic road eligible for nomination at the time of construction; the road was restored once construction was complete. This was accepted by the Oregon SHPO as adequate mitigations, as indicated in the Project’s FERC application.

Since the time of construction, the historic roadway was listed, in 2010, on the National Register of Historic Places. The Santiam Wagon Road was built from west to east to move livestock over the Cascade Mountains to central Oregon’s grass lands and to provide access to markets in eastern Oregon and Idaho. Operating as a toll road until 1914, the Santiam Wagon Road was a maintained route that included bridges, road houses, and toll gates. In 1905, the first automobiles to cross the North American continent passed over the Santiam Wagon Road in a transcontinental auto race from New York City to the Lewis and Clark Exposition in Portland. Remnants of the Santiam Wagon Road have been preserved in the Willamette National Forest and provide the longest stretches (with very high integrity) of any historic wagon road in western Oregon.

The conditions of the Project’s SUP agreement with the USFS dictates the maintenance methods the Project must employ to maintain the integrity and authenticity of this historic roadway, namely:

- All road work must be reviewed and approved in writing by the Forest Service prior to implementation whenever possible.
- Avoid the use of crushed gravel for road repairs. Rock material for filling potholes or repairing storm damage should be a mix of native material between ¾" and 3-inch diameter. Source material for road repairs must be pre-approved by the Forest Service.
- Road grading should only occur to level rock material used to fill potholes or fix storm damage. Grading should be accomplished with tractor equipment used to place rock material, and not a road grader.
- Brushing along this road segment should be performed to maintain a 10-foot right of way. Herbaceous vegetation less than 1-foot high should be left to grow in the center of the roadway.
- Downed trees across the road should be cut out only far enough to allow safe passage of maintenance vehicles and to maintain a ten-foot right of way.
- Buildings should be painted a drab forest color, pre-approved by the Forest Service, to make the building less obtrusive to wagon road travelers and campers at Trout Creek campground.
- Road maintenance should protect the historic integrity of the corridor and road surface, emulating road and vegetative conditions when the Santiam Wagon Road was used as a commercial toll road in the late 1800's.
- See Exhibit 9 of the original LIHI application.

We are also requesting the PLUS standard for this criterion for the project as a whole. Each year, Project staff voluntarily host area school children on a tour of the Project's facilities to demonstrate hydroelectric power and clean energy sources. Part of this annual tour includes a presentation on the area's history and importance to original Native Americans and subsequent white settlers, including the construction and use of the Old Santiam Wagon Road and its significance to the growth and commerce for the area by establishing passage to eastern Oregon.



The Santiam Wagon Road (aka the Willamette Valley and Cascade Mountain Wagon Road) began in Lebanon, Oregon and continued east over the Santiam Pass, ending at Camp Polk near Sisters, Oregon. It served as the dominant route across the Cascades from 1865 to 1939, although use for freight declined with the increase in trains in the late 1800's.



Pictures from annual powerhouse tours for area school children (1988-top left; 2005-right, below; and 2003, bottom).



III. B.2.8. Recreational Resources Standards in Zones 1, 2, and 3

Table B-9. Information Required to Support Recreational Resources Standards.

<i>Criterion</i>	<i>Standard</i>	<i>Instructions</i>
H	1	<p><u>Not Applicable / De Minimis Effect:</u></p> <ul style="list-style-type: none"> Document that the facility does not occupy lands or waters to which public access can be granted and that the facility does not otherwise impact recreational opportunities in the facility area.

No specific recommendations for recreational access were issued as part of the Project’s FERC exemption. However, the Project is located on Forest Service lands and a campground is located across the river from the powerhouse. The Project’s Special Use Permit with the USFS provides conditions guiding the use of Forest Service lands and specific requirements for the Project, namely:

- Buildings should be painted a drab forest color to make the buildings less obtrusive to wagon road travelers and campers at Trout Creek campground.
- Shiny metallic surfaces (antennae) should be painted or dulled to minimize their reflective glare.
- Native understory vegetation should be maintained on the north and east sides of the powerhouse to create visual screens from the campground across the South Santiam River and to soften the buildings’ edges and solid color continuity.

Recreational access and use is not impacted by the Project. LIHI criteria are most focused on water-based recreation. The H, 1-standard applies because there are no water-based recreational activities on Falls Creek to be impacted, because of the steep slope of the creek. In other areas of recreation, conversations with the Forest Service corroborated this, adding that the applicant is very agreeable to giving tours and providing campfire presentations at the campground, describing the Project. Although some noise can be heard from the powerhouse during high flow periods, the campground’s peak season (July-August) generally coincides with when the Project is off-line, resulting in minimal impacts to recreational access. The only access along the Old Santiam Wagon Road is by foot-traffic as the USFS maintains a locked gate on this section of roadway to eliminate traffic to an Elk Reserve located on land next to the powerhouse facility. (See Exhibits 4 and 9 of the original LIHI application.)

Part IV. SWORN STATEMENT AND WAIVER

*Original Emailed to LIHI May 5, 2017.

Falls Creek Hydro Project, L.P.

SWORN STATEMENT

As an Authorized Representative of *Falls Creek Hydroelectric Project, L.P.*, the Undersigned attests that the material presented in the application is true and complete.

The Undersigned acknowledges that the primary goal of the Low Impact Hydropower Institute's Certification Program is public benefit, and that the LIHI Governing Board and its agents are not responsible for financial or other private consequences of its certification decisions.

The undersigned further acknowledges that if certification of the applying facility is issued, the LIHI Certification Mark License Agreement must be executed prior to marketing the electricity product as LIHI Certified.

The undersigned Applicant further agrees to hold the Low Impact Hydropower Institute, the Governing Board and its agents harmless for any decision rendered on this or other applications, from any consequences of disclosing or publishing any submitted certification application materials to the public, or on any other action pursuant to the Low Impact Hydropower Institute's Certification Program.

Company Name: *Falls Creek Hydroelectric Project, L.P.*

Authorize Representative Name: *Gary P. Marcus* Title: *General Partner*

Gary P. Marcus

State of *Arizona*)

County of *Pima*)

On this, the *5th* day of *May*, 20 *17*, before me a notary public, the undersigned officer, personally appeared *Gary P. Marcus*, known to me (or satisfactorily proven) to be the person whose name is subscribed to the within instrument, and acknowledged that he executed the same for the purposes therein contained. In witness hereof, I hereunto set my hand and official seal.

Notary Public *[Signature]*



Part V. CONTACTS

Table V-1. Complete contact information for the facility owner and other associated parties.

Project Owner:	
Name and Title	<i>Gary P. Marcus, General Partner</i>
Company	<i>Falls Creek Hydroelectric Project, L.P.</i>
Phone	<i>541-683-5200</i>
Email Address	GaryMarcus1@aol.com ; dmoore@frontier-technology.com
Mailing Address	<i>P.O. Box 23508, Eugene, OR 97402</i>
Project Operator (if different from Owner):	
Name and Title	
Company	
Phone	
Email Address	
Mailing Address	
Consulting Firm / Agent for LIHI Program (if different from above):	
Name and Title	
Company	
Phone	
Email Address	
Mailing Address	
Compliance Contact (responsible for LIHI Program requirements):	
Name and Title	<i>Gary P. Marcus, General Partner</i>
Company	<i>Falls Creek Hydroelectric Project, L.P.</i>
Phone	<i>541-683-5200</i>
Email Address	GaryMarcus1@aol.com ; dmoore@frontier-technology.com
Mailing Address	<i>P.O. Box 23508, Eugene, OR 97402</i>
Party responsible for accounts payable:	
Name and Title	<i>Diane Moore</i>
Company	<i>Falls Creek H.P., L.P. & Frontier Technology, Inc.</i>
Phone	<i>541-683-5200</i>
Email Address	dmoore@frontier-technology.com
Mailing Address	<i>P.O. Box 23508, Eugene, OR 97402</i>

Table V-2. Current and relevant state, federal, and county resource agency contacts.

Agency Contact (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources <u>X</u> , Watersheds __, T/E Spp. __, Cultural/Historic Resources <u>X</u> , Recreation <u>X</u>):	
Agency Name	U.S. Dept. of Agriculture, Forest Service
Name and Title	Meg Mitchell, Forest Supervisor & Gordie Blum, Deputy Forest Supervisor
Phone	541-225-6300
Email address	
Mailing Address	3106 Pierce Parkway, Ste. D, Springfield, OR 97477

Agency Contact (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources <u>X</u> , Watersheds __, T/E Spp. __, Cultural/Historic Resources <u>X</u> , Recreation <u>X</u>):	
Agency Name	Willamette National Forest
Name and Title	Peggy Keen, Special Use Coordinator
Phone	541-854-4202
Email address	pkeen@fs.fed.us
Mailing Address	Detroit Ranger District, HC 73 Box 320, Mill City, OR 97360

Agency Contact (Check area of responsibility: Flows <u>X</u> , Water Quality __, Fish/Wildlife Resources __, Watersheds <u>X</u> , T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	Oregon Water Resources Department
Name and Title	Mary S. Grainey, Hydroelectric Program Coordinator
Phone	503-986-0833
Email address	Mary.S.Grainey@state.or.us
Mailing Address	725 Summer Street NE, Ste A, Salem, OR 97301-1271

Agency Contact (Check area of responsibility: Flows __, Water Quality <u>X</u> , Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	Environmental Protection Agency, U.S. EPA, Region 10
Name and Title	Jeffrey M. Philip
Phone	206-553-1465
Email address	Philip.Jeff@epamail.epa.gov
Mailing Address	1200 Sixth Avenue, Mail Code: ETPA-081, Seattle, WA 98101

Agency Contact (Check area of responsibility: Flows <u>X</u> , Water Quality __, Fish/Wildlife Resources <u>X</u> , Watersheds <u>X</u> , T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	Oregon Dept. of Fish and Wildlife
Name and Title	Ken Homolka, Hydropower Program Leader
Phone	503-947-6090
Email address	Ken.Homolka@state.or.us
Mailing Address	4034 Fairview Industrial Drive SE, Salem, OR 97302

Agency Contact (Check area of responsibility: Flows __, Water Quality <u>X</u> , Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	Oregon Dept. of Environmental Quality, Portland Office
Name and Title	Chris Stine, PE, Water Quality Standards
Phone	503-229-5263
Email address	Chris.Stine@state.or.us
Mailing Address	700 NE Multnomah St., Suite 600, Portland, OR 97232

Agency Contact (Check area of responsibility: Flows __, Water Quality <u>X</u> , Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	Oregon DEQ – Portland Office
Name and Title	
Phone	503-229-5263
Email address	
Mailing Address	2020 SW Fourth Avenue, Ste 400, Portland, OR 97201-4987

Agency Contact (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources <u>X</u> , Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	Oregon Dept. of Fish and Wildlife
Name and Title	Wayne Hunt, Fish Biologist
Phone	503-378-6925
Email address	
Mailing Address	4412 Silverton Road NE, Salem, OR 97305

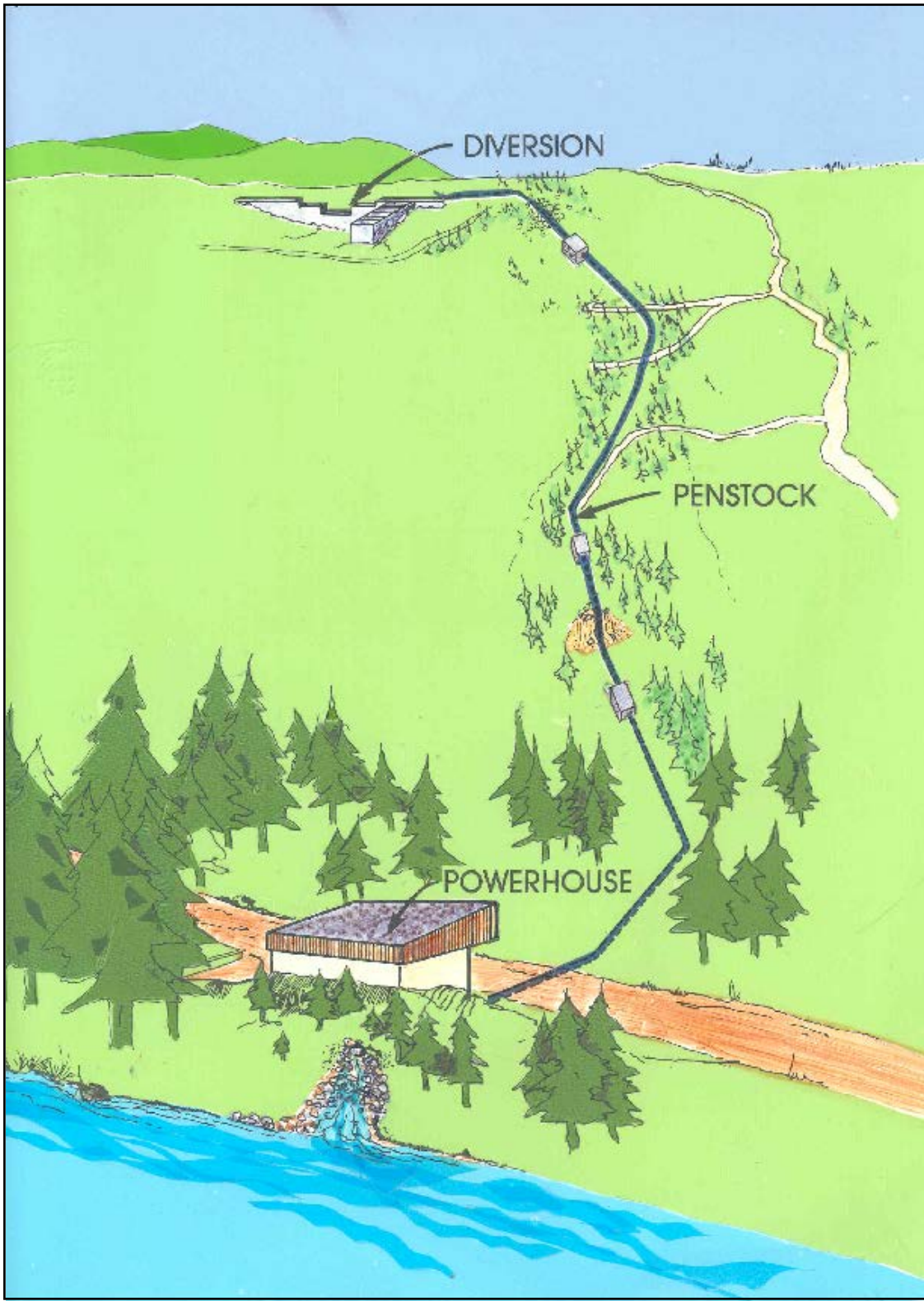
Agency Contact (Check area of responsibility: Flows __, Water Quality <u>X</u> , Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	Oregon Dept. of Environmental Quality
Name and Title	Dennis Belsky, Western Region Water Quality Section
Phone	541-776-6010
Email address	
Mailing Address	201 W. Main, Suite 2-D, Medford, OR 97501

Part VI. STAKEHOLDERS

Names, addresses, phone numbers, and e-mail for local non-governmental stakeholders

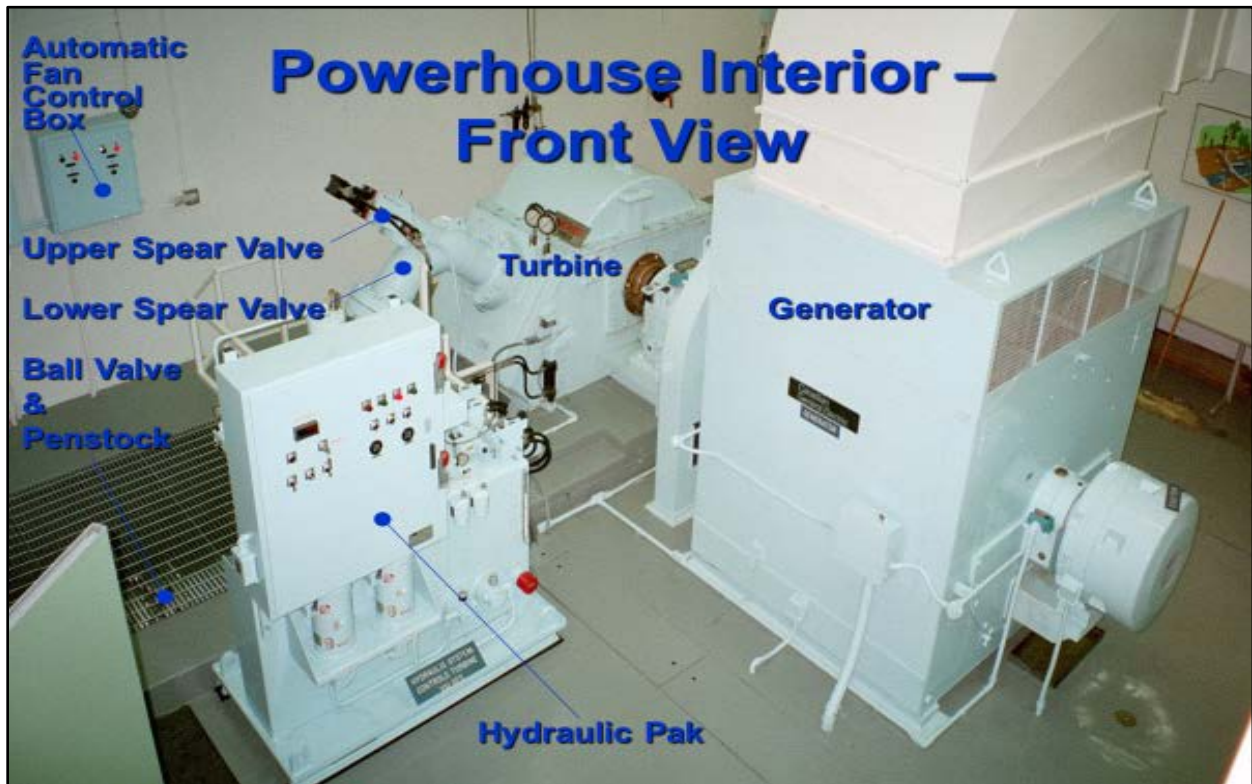
Name and Contact	Address	Phone	E-Mail	Description
Selco Community Credit Union Sean Huntington V.P., Commercial Loan Officer	925 Harlow Rd. Springfield, OR 97477	541-744-7515	shuntington@selco.org	Equipment loan & LOC - 2005
Gary P. Marcus	P.O. Box 23508 Eugene, OR 97402	541-953-2725	GaryMarcus1@aol.com	General Partner
Frontier Technology, Inc.	P.O. Box 23508 Eugene, OR 97402	541-683-5200	Dmoore@frontier-technology.com	Limited Partner

Part VII. PROJECT PHOTOGRAPHS





Photographs of the key features of the project.





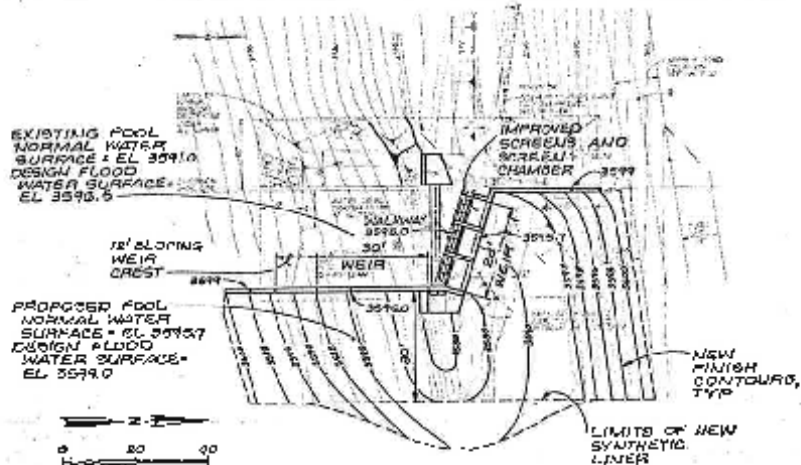
DC Battery Bank (left).



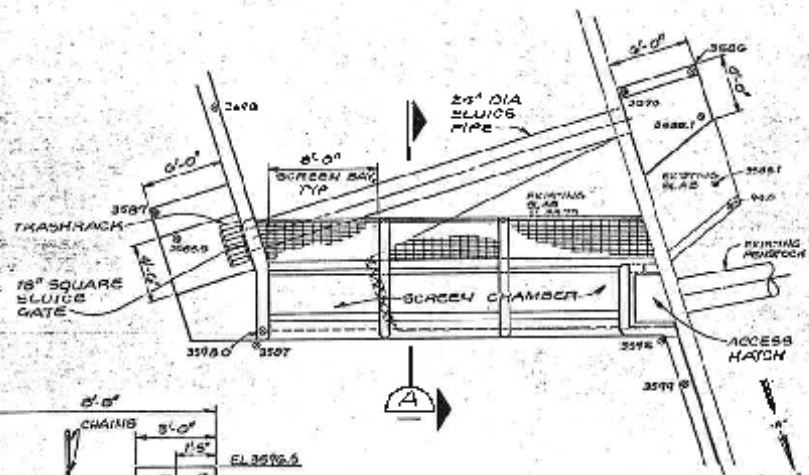


(Above) The powerhouse and switchyard are surrounded by an earthen berm, planted with shrubbery and trees, to both camouflage the structure and dampen sound traveling across the river to campers at Trout Creek Campground.

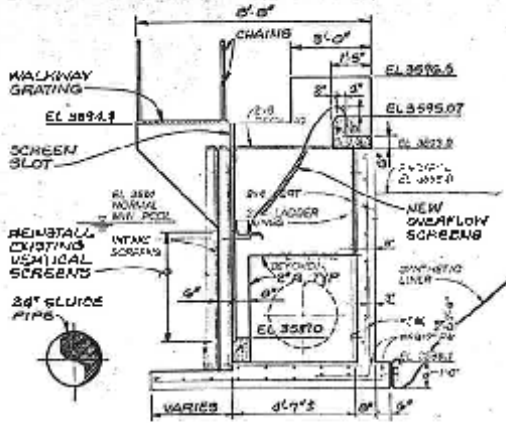
(Left) The tailrace was constructed to immitate a natural stream flowing into the South Santiam River.



SITE PLAN



SCREEN CHAMBER PLAN



SECTION (A)

PROPOSED DIVERSION IMPROVEMENTS
 FALLS CREEK HYDROELECTRIC PROJECT
 FRONTIER TECHNOLOGY, INC.
 EUGENE, OREGON
 FEBRUARY 1992

Diversion Remodel 1993, self-cleaning screens design.

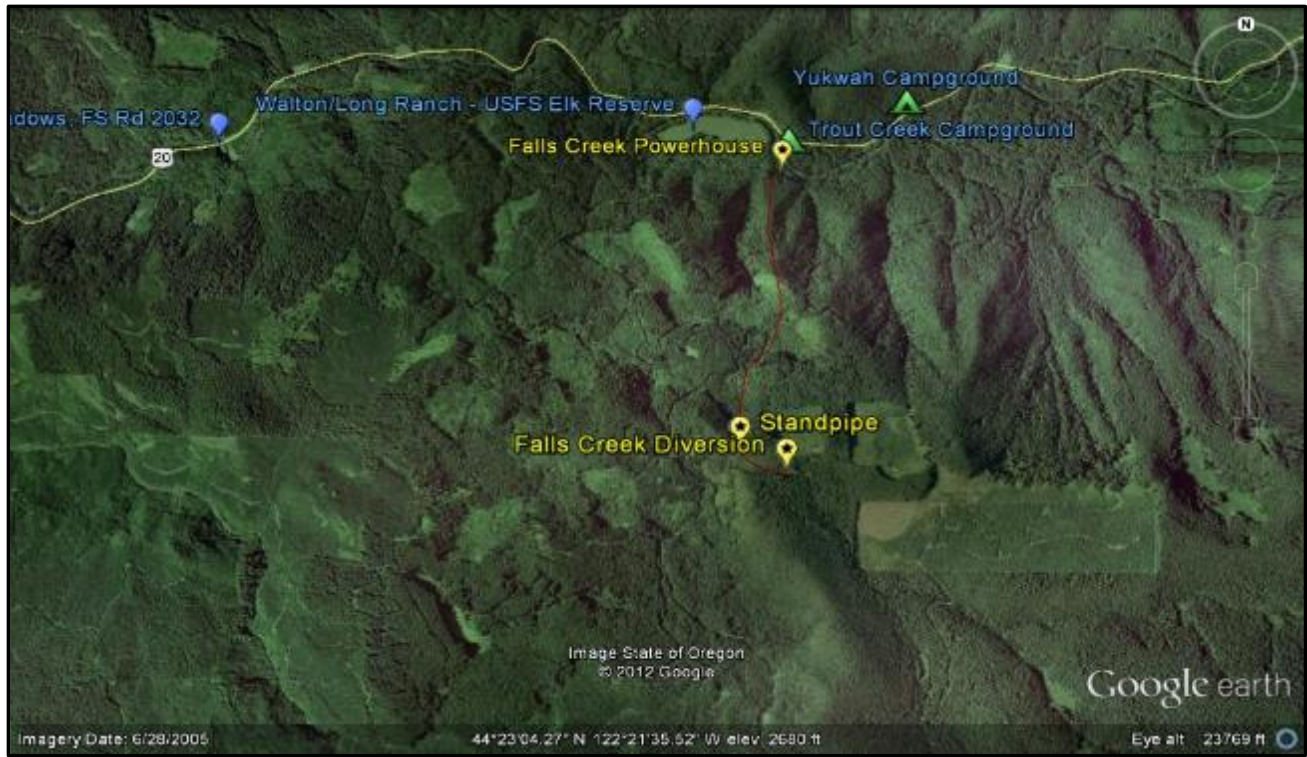
Standpipe (right) and buried penstock (below).



Buried penstock at crest of mountain just beyond standpipe (left) and along penstock corridor (below).



Part VIII. PROJECT MAPS AND DIAGRAMS



1. Location of Falls Creek Powerhouse

Township 14S Range 4E Sections 4 & 5, and Township 13S Range 4E, Section 32.

Latitude: 44 degrees 23 minutes, 48.66 seconds N

Longitude: -122 degrees, 21 minutes, 0.86 seconds W

Elevation = 1258'

2. Location of Falls Creek Diversion

Latitude: 44 degrees, 22 minutes, 46.59 seconds N

Longitude: -122 degrees, 21 minutes, 03.43 seconds W

Elevation = 3,605'

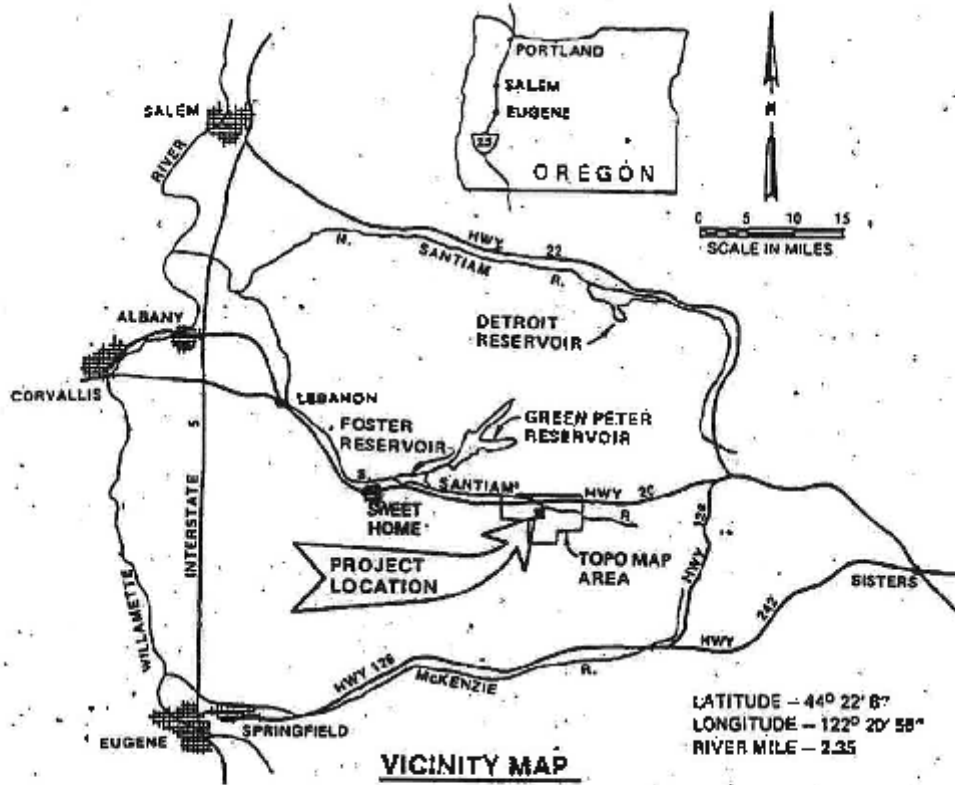
3. Location of Standpipe

Latitude: 44 degrees, 22 minutes, 51.11 seconds N

Longitude: -122 degrees, 21 minutes, 15.21 seconds W

Elevation – 3,568'

04974 (Falls Creek - Dam)



LOCATION POINT OF DIVERSION
N 7,200 feet, W 1,200 feet of SE corner of
Section 5 being within the NE 1/4 of the SE 1/4 of
Section 5, Township 14S, Range 4E, W1/4, in Linn County

**PROPOSED FALLS CREEK
HYDROELECTRIC PROJECT**

IN: FALLS CREEK RIVER MILE: 2.35
NEAR: SWEET HOME
COUNTY: LINN
APPLICANT: GARY P. MARCUS
DATE: APRIL 11, 1983

Attachment A: Oregon Dept. of Water Resources – Proposed Final Order